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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/580,552	05/26/2006	Beverley Brown	MERCK-3181	5966

23599 7590 03/16/2010  
MILLEN, WHITE, ZELANO & BRANIGAN, P.C.  
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SUITE 1400  
ARLINGTON, VA 22201

EXAMINER
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NWAONICHA, CHUKWUMA O

ART UNIT	PAPER NUMBER
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1621

NOTIFICATION DATE	DELIVERY MODE
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03/16/2010

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docketing@mwzb.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/580,552	<b>Applicant(s)</b> BROWN ET AL.	
	<b>Examiner</b> CHUKWUMA O. NWAONICHA	<b>Art Unit</b> 1621	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on 10/13/09, 01/15/10, 01/20/10 & 01/26/10.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)         | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Current Status*

1. This action is responsive to Applicants' Appeal Brief and amendments of 13 October 2009, 15 January 2010, 20 January 2010 and 26 January 2010.
2. Receipt and entry of Applicants' Appeal Brief and amendment is acknowledged.
3. Claims 1-28 are pending.
4. The rejection of claims 1-28 under 35 U.S.C. 103 as being unpatentable over Brown et al., {WO 0245184, same as US 7,095,044} in view of Minakata, {WO 2003016599, same as US 7,061,010} is withdrawn because the prior art references cited does not teach all the claims limitation.
5. **The finality of the previous rejection has been withdrawn in favor of this rejection.**

### *New Rejection*

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

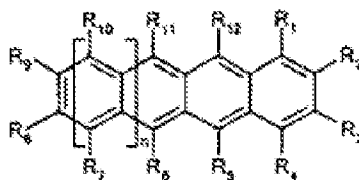
USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

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1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

**Claims** 1-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brown et al., {WO 02/45184, same as US 7,095,044} in view of Smith et al {WO 03/028125}.

Applicants claim substituted polyacene compounds, an organic semiconducting layer formulation and electronic devices with an active ingredient of the general formula I; wherein all the variables are as defined in the claims.



formula I

**Determination of the scope and content of the prior art (M.P.E.P. §2141.01)**

Brown et al. teach a field effect transistor semiconductor layer formulation comprising a **substituted polyacene compounds** and organic binders, and electronic devices. Specifically, Brown et al. teach that polyacene rings may be optionally substituted with alkyl, alkoxy, polyalkoxy, thioalkyl, acyl, aryl or substituted aryl groups, a fluorine atom, a cyano group, a nitro group or an optionally substituted secondary or tertiary alkylamine or arylamine -N(R<sub>3</sub>)(R<sub>4</sub>), where R<sub>3</sub> and R<sub>4</sub> each independently is H, optionally substituted alkyl, optionally substituted aryl, alkoxy or polyalkoxy groups. The alkyl and aryl groups may be optionally fluorinated. The organic binders have inherent

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conductivity of less than  $10^{-6} \text{Scm}^{-1}$  and a permittivity at 1000 Hz of less than 3.3. The organic binders are homopolymers of styrene. See columns 3-9 and the examples.

**Ascertainment of the difference between the prior art and the claims (M.P.E.P. §2141.02)**

Brown et al. semiconducting layer formulation or composition and electronic devices differ from the instantly claimed substituted polyacene compounds, an organic semiconducting layer formulation and electronic devices in that the instantly claimed substituted polyacene compounds, an organic semiconducting layer formulation and electronic devices comprise polyacene compound of formula I wherein at least one of the variables  $R_1$  to  $R_{12}$  is substituted  $C_1$ - $C_{40}$  hydrocarbyl group while Brown et al. teach a polyacene in general, its derivative, its formulation with a organic binder and electronic devices. See columns 3 and 4. Additionally, Applicants claim a semiconducting layer formulation or composition with an organic binder in general with a permittivity at 1000 Hz of 3.3 or less while Brown et al. semiconducting layer formulation or composition with specific organic binders with a permittivity at 1000 Hz of 3.3 or less as shown in column 9 table 2.

However, Smith et al. cure the deficiencies of Brown et al. by teaching an organic semiconducting layer formulation comprising substituted polyacene compounds. Smith et al. teach that the substituted pentacene compounds disclosed therein are improved alternatives to unsubstituted pentacene (first full paragraph on page 4) for use in semiconductor devices such as thin film transistors. It would have been obvious to substitute the substituted pentacene compounds of the '125 publication for

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unsubstituted pentacene in the organic semiconducting layer formulation of the '184 publication. One would be motivated to make the substitution in view of the stated advantages of the substituted pentacene compounds, including increased solubility in organic solvents (first full paragraph on page 2), improved electronic stability and reproducibility of performance characteristics in a semiconductor device (first full paragraph on page 4).

**Finding of prima facie obviousness--rational and motivation (M.P.E.P.. §2142-2143)**

The instantly claimed polyacene compound, semiconducting layer formulation and electronic device would have been suggested to one of ordinary skill because one of ordinary skill wishing to obtain polyacene compounds, semiconducting layer formulation and electronic device layer is taught to select a substituted polyacene compound and organic binders of Brown et al. and Smith et al.

One of ordinary skill in the art would have a reasonable expectation of success in practicing the instant invention by evaluating different substituted polyacene compounds and organic binders with a permittivity at 1000 Hz of 3.3 or less that make a composition or a formulation as taught by Brown et al. and Smith et al. to arrive at the instantly claimed substituted polyacene compounds, an organic semiconducting layer formulation and electronic devices. Said person would have been motivated to practice the teaching of the references cited because semiconducting layer formulation with substituted polyacene compound and organic binder are useful in electronics and other industrial applications. Further, one of ordinary skill in the art would have been

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motivated to correlate the teachings of Brown et al. and Smith et al. in order to obtain substituted polyacene compounds, an organic semiconducting layer formulation with organic binder and electronic devices. The instantly claimed invention would therefore have been obvious to one of ordinary skill in the art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chukwuma O. Nwaonicha whose telephone number is 571-272-2908. The examiner can normally be reached on Monday thru Friday, 8:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel Sullivan can be reached on 571-272-0779. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Chukwuma O. Nwaonicha/  
Examiner, Art Unit 1621

/Sikarl A. Witherspoon/  
Primary Examiner, Art Unit 1621

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(for) Daniel Sullivan  
Supervisory Patent Examiner,  
Technology Center 1600